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May 1987

The Naval Aviation Safety Review V. 32 #7

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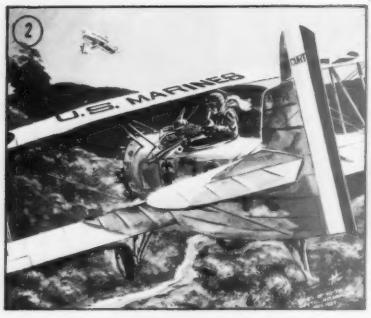
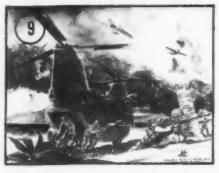
"Nothing comforts a soldier, ankle-deep in mud, faced by a roadblock of fortified strong-holds, as much as the sight of bombs wreaking havoc on stubborn enemy positions. It puts heart into him." Gen. R.L. Eichelberger on the subject of Marine close air support, Philippines, August 1945.

Marine Corps Aviation 75th Anniversary 1912 — 1987

Approach wishes to thank the following individuals for their assistance in preparing this issue:
Mr. John T. Dyer, Jr., Curator of Art, Marine Corps Museum; Lt. Col. A. Michael Leahy, USMCR, Artist; Mr. Jeff McNelly, Artist; Mr. Joe Plummer, Artist; and Mr. Dwight Timm, McDonnell Aircraft Company.

Key to Cover Art





1. Fly with the U.S. Marines by Howard Chandler Christy. A recruiting poster of the 1920s. 2. *Ocotal Close Air Support* by Lt. Col. A. Michael Leahy, USMCR. Action in Nicaragua brings the first use of dive bombing. 3. *Aviators' Debriefing by* Maj. Alex Raymond, USMCR. Marine carrier aviators during World War II drawn by the creator of the comic strip "Flash Gordon." 4. *Hoot Owl* by Master Gunnery Sgt. Wendell A. Parks, USMC. The AV-8 Harrier depicted during the first acceptance tests in the early 1970s. 5. *"Indian Joe" Bauer's Wildcat, VMF-212, Guadalcanal, 1942* by Lt. Col. Leahy. Marine fighter of the "Cactus Air Force" in the Solomons. 6. *Ready to Launch* by Maj. John T. Dyer, USMCR. An F-4B Phantom crew of VMFA-115 prepares for a mission in Vietnam. 7. *Marine Cobra Down, St. George's, Grenada* by Lt. Col. Leahy. Capt. Jeb Seagel pulls Capt. Tim Howard from their burning helicopter during Operation Urgent Fury, the invasion of Grenada in 1983. Minutes later, Capt. Seagle was killed as he tried to run for help. He received a posthumous Navy Cross, while Capt. Howard, badly wounded, received the Silver Star. 8. *Securing Pearls Airport, Temporarily Named "MCAS Douglas"* by Lt. Col. Leahy. The airport in Grenada renamed for a Marine who was killed in Lebanon. 9. *Rangers Assault Grand Anse in Marine Helos* by Lt. Col. Leahy. Marine helicopters transport Army Rangers into action in Grenada.

Marine Aviation

. . . of great benefit

Marine Aviation had its start in 1912 when Commandant of the Marine Corps, Maj. Gen. Biddle decided that adding an aviation element to the Marines would be "of great benefit." The anniversary is celebrated on May 22, 1912, the date 1st Lt. Alfred Cunningham reported to Annapolis for flight training. As our cover shows, the rest is history. To mark this anniversary, Approach dedicates this issue to the Marines.

Happy 75th
LCdr. Dave Parsons
Editor and former Marine

inside approach

Vol. 32 No. 7

Marine Corps Aviation 75th Anniversary 1912 — 1987

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Safety and the M

Approach Interviews Lt. Gen. Keith A. Smith, USMC
Deputy Chief of Staff for Aviation

By Peter Mersky

MARINE Corps Aviation celebrates its 75th birthday this month. The Marines are a unique organization in that the Fleet Marine Force has its own dedicated air force for close air support and troop lift. Marine air has seen combat since 1918, and has grown from one small group of six officers, 43 troops and five aircraft in 1917, to a force of 106 squadrons and associated units manned by over 66,500 personnel, both active duty and reserve.

The last five years have seen an influx of new programs: the AV-8B Harrier II, the F/A-18A Hornet, the CH-53E Super Stallion, and Tactical Air Operations Module Command and Control equipment. Always in the forefront of military aviation development, Marine aviators glory in their specialized missions, many of which involve flying down on the deck to support their counterparts on the ground.

We previously spoke with Lt. Gen. Keith Smith, DC/S(Air) in 1985. The occasion was Approach's 30th anniversary. Now, two years later, we asked Lt. Gen. Smith for an update for Marine Air's 75th. His comments ranged from aviation safety to current performance and future prospects.

Before assuming his present position, Lt. Gen. Smith served in a broad spectrum of aviation assignments including a tour flying F-4s in Vietnam and as commanding officer of VMFA 542. He later served as Commanding General MCAS Cherry Point, Deputy Chief of Staff for Requirements and Programs, Headquarters, USMC, and Commanding General 2nd Marine Aircraft Wing.

In his present assignment, Lt. Gen. Smith is responsible for the Marines' aviation programs and the personnel who fly and maintain the aircraft.

Marines at 75

General Smith: Before we begin, I'd like to talk about the total modernization that's going on in the Marine Corps. It plays a very important role. Everything from the rifleman's rifle to the most sophisticated airplane we operate is being modernized.

Consider the equipment that Marine air control squadrons operate, which is being totally replaced, improving survivability and logistics. The new area of fiber-optics technology permits quantum improvements. Trucks once loaded with cables as big around as your wrist to interconnect all the vans now carry cables smaller in diameter than my little finger, and one guy can carry 300 or 400 feet of it. It's totally reliable and allows us to use remote antennas for both radar and radio, diverting the signal away from the primary site.

The Tactical Air Command Center is also being modernized, giving the tactical air commander state-of-the-art capability.

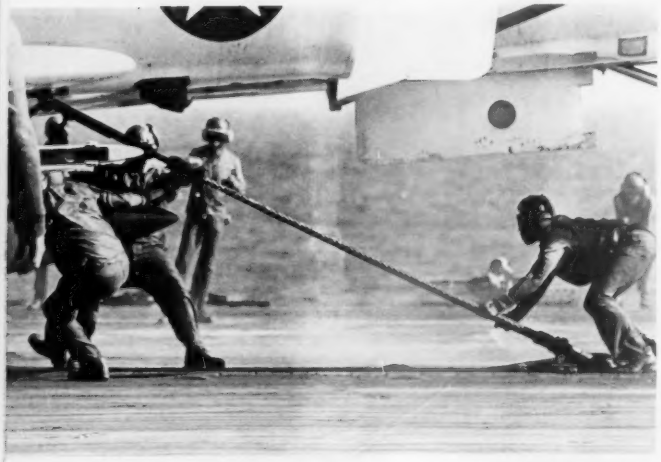
All this gives the command post a capability that's equal to the hardware in the air, the F/A-18, AV-8B and EA-6B. In the logistics area, we get twice the capability and reliability for one-third the weight.

Then there's the improved accuracy in our air-to-ground weapons platforms. There's a saying about the F/A-18 that after your second hop, if you're not within 25-foot CEP, you buy the bar a round of drinks. And nobody's buying because the CEP's right in there. First tour guys or veterans. It makes no difference.

Two years ago, we talked about safety. And we talk about safety again now, of course. The rule always has to be: The Marine in the cockpit is the final authority. If he sees something he doesn't like, he will be permitted to say no without retribution. It's got to be that way. And, for some reason, we are not getting that message across to everybody in Marine Corps aviation. I don't know if that's because of the macho image of the Marine, but every place I go, I try to make the point.

Now, if we were in combat, it might be a different story. In peacetime there is no mission so important that we can't say no to it. I just wanted to reinforce that observation because it's so important. Although we hold the pilot ultimately responsible, we need for him, in turn, to have absolute confidence in the leadership, that we're going to support him in his decision.

If he had an opportunity to say no — and didn't, and subsequently jeopardized the equipment or lives — he's got to



ABCM W.D. Griffin

be held accountable. And I don't know of any case, since I've been in this job, where a guy said no and was reprimanded for his decision.

I'm sure that when the fleet reads this article, they will correspond with me, and that's great because I need to have quality control working up as well as down. And if some of this is not coming to me, I need to have it on hand so I can take steps to correct it.

Approach: When we interviewed you in July 1985, you stressed the need for Marine safety awareness. Now, two years later, what can be done to increase these aspects of safety, and what do you say now to the people in the squadrons?

General Smith: The mishap rate has continued a downward trend since 1980, except for a slight rise in 1985. In 1986, the trend turned back down with the Marine Corps rate being 4.40, the best year in our history. The 1987 record concerns us due to the five mishaps we had in January. This is the worst start for any year since 1981, and this trend must be reversed. We cannot relax our efforts.

Particular attention must continue to be paid to areas such as aircrew coordination, disorientation, midair collisions, judgment, collateral duties, administration workload, night helicopter operations, training, operational tempo, unit integrity fragmentation, and accuracy of publications and directives. Further decreases in the mishap rate are essential, and each Marine must continue to do his part to achieve the goal of 4.00 set by the Commandant in CY 87.

Approach: In 1985 you said, "We don't have a weapon system with less than 65 percent Full Mission Capability (FMC), maybe 70 percent." Is this still valid, especially in those communities with recent mishaps?

General Smith: Since our last interview, the overall average FMC in the Marine Corps has continued to improve. For the past 18 months — July 85 to December 86 — it was 68 percent; calendar year 1986 was 69.4 percent.

During 1986, the AV-8B FMC was 67.8 percent while the CH-53E was 68.0 percent.

In 1986, there were no Marine Corps weapons systems below 65 percent MC, but several fell below that percentage in FMC readiness. Most that fell below the 65 percent FMC

USMC Mission Capable and Full Mission Capable Rates, CY 1986

HELO	MC	FMC
AH-1J(T)	87.5	84.3
AH-1T	85.3	75.6
UH-1E	75.3	65.7
UH-1N	81.6	74.5
UH-1N(T)	87.4	85.1
CH-46E	83.8	78.7
CH-46E(T)	77.1	74.1
CH-53A	74.2	65.6
CH-53A(T)	70.7	68.1
CH-53D	74.7	67.6
CH-53E	80.4	68.0
CH-53E(T)	79.1	75.3
FIXED WING	**MC**	**FMC**
OV-10A	80.0	70.2
A-4F	81.6	75.2
AV-8B	75.7	67.8
AV-8A(T)	78.0	74.5
EA-6A	79.2	71.6
EA-6B	84.2	74.3
F-4S	81.2	71.8
F/A-18A	85.2	80.2

(T) = Training squadron

. . . The Marine in the cockpit is the final authority. If he sees something he doesn't like, he will be permitted to say no without retribution. It's got to be that way . . .

mark are weapon systems that have very small or dwindling inventories, such as the OV-10D, AH-1J, RF-4B, OA-4M and TA-4F/J. Based on these small communities, one airframe losing its FMC status distorts the readiness picture disproportionately.

Approach: Often, the price of increased operational readiness in high-risk missions, such as low-level flying and during night TERF, is an increased mishap rate. Can you comment on the Marine decision to pay this price?

General Smith: Increased operational readiness may increase the risk we face during peacetime, but we must remember our mission includes being able to fight and win. Our peacetime training is designed to permit us to win wars with minimum losses. Our peacetime training is based upon a building-block approach where demonstrated proficiency is required prior to moving to increased levels of difficulty. This approach is intentionally designed to ensure we don't expose anyone to a risk that he has not been trained to handle successfully.

Only a very small percentage of the mishaps we had in 1985, 1986 and 1987 occurred on high-risk missions such as TERF or other low-altitude training. A more significant percentage of our mishaps occurred during low-risk phases of flight. We must continue to stress the constant attention required whenever we fly.

Approach: An unfortunate consequence of the can-do spirit is pressure to always say, "Yes, I can." What do you say to the junior officers and junior enlisted who are faced with difficult decisions such as go/no-go in inclement weather or regarding crew rest? This may touch on the circumstances in VMFA 542 during your tenure as CO in 1969, when, after three aircraft losses and six crewmen lost in four days, you requested a 48-hour stand-down from your group commander for intensive ground school training in basics, and got it — in a combat zone.

General Smith: As I said earlier, in peacetime there is no mission that is so important that it *must* be flown. The pilot remains the last person in a long chain of people who are instrumental in getting a flight completed safely. The pilot knows his capabilities, limitations and exactly what he is facing: weather, crew rest, personal stress. As the last person in this safety chain, he has even more responsibility than anyone to ensure each flight is safe. He must always be on guard against complacency and treat every detail with respect because others' lives, as well as his own, depend on him.

He must constantly ensure that the basic foundation of his

LCdr. D.L. Parsons

ABCM W.D. Griffin

training and equipment is solid. If not, the whole structure may crumble. Just as we returned to the basics in VMFA 542 when we had losses, we must maintain the basics or pay a price we can't afford.

Approach: What do you envision for the MV-22 Osprey tiltrotor in terms of pilot training? A hybrid syllabus involving fixed-wing and helicopter training, or something derived from the AV-8B syllabus?

General Smith: Our present plan includes an extensive study of existing basic pilot training, followed by Osprey-specific training at a Marine Fleet Replacement Squadron.

The Naval Air Systems Command has tasked Pensacola and an independent contractor to conduct student entry analyses to confirm or modify this plan. These analyses are examining *all* present training tracks, balanced against a recently completed Osprey pilot task list, to determine if an existing or modified training track is required. We will complete these studies and confirm or refine our plans this year.

Approach: What do you think of the new technology that the MV-22 represents and how it is being accepted, or not accepted?

General Smith: There are a lot of people in this country who stand back when we bring on something as different as the MV-22. We had the same discussion when we introduced the helicopter, the supersonic fighter, the jet engine and the Harrier. The MV-22 is very important to us in order to complete our mission. The CH-46 is inadequate to perform the mission we have now; and the MV-22 will not only take the place of the 46s, but it has the capabilities to do all the things that the 46 cannot do now, specifically, fly far, fly fast and have a good lift capability.

Just to give you an idea of how this all works together, the MV-22-equipped task force could stand offshore 400 miles —well over the horizon — of the United States East Coast and prosecute an assault anywhere between New York and Florida within 24 hours.

Approach: The AV-8B is making its first regular deployments right now. What are the Marines going to be doing and looking for with the Harrier II?

General Smith: The past year has been eventful for the Harrier Marines. Four deployments to the Mediterranean to participate in exercises preceded the first six-month shipboard deployment by VMA 331's Detachment B with the 13th MAU to WESTPAC.

The first TAV-8B two-seat trainer is now undergoing evaluation; two more TAV-8Bs will be delivered this year, as will the first night-attack version of the Harrier II, which is scheduled to enter service in 1989.

More recently, the Marine Corps received SECNAV approval for upgrading the AV-8B power plant, which will significantly improve reliability and maintainability of the existing engine when the upgrade arrives in 1990.

Approach: Could you comment on the CH-53E community and its safety problems? Is the powerful Super Stallion too much for junior aviators, or are the problems normal in the introduction of a new aircraft?

General Smith: First, let me set the record straight. Compared to other helicopters we have introduced in the recent past —the CH-46, the UH-1 and the CH-53A/D — the mishap rate for the CH-53E during the first five years of operational service is actually better. Now, there are other factors which must be considered that don't make the comparison cut and dried.

The other helicopters were introduced in the early 1960s, when rotary-wing aviation was stepping into the turbine age and these were all completely new airframes. We introduced the CH-53E in 1981, and it was a derivative of the CH-53 family with which we had considerable experience. On the other hand, we are taking these aircraft into the force at a very slow rate compared to the Vietnam years and we don't have a large number of flight hours.

Each mishap tends to really skew statistics. For example, we had one Class A flight-related mishap in 1986 for a rate of 6.3. This seems quite high compared to our overall rate of 4.40. However, had we not had that *one*, we would have had a 0.0 and you might not be asking this question. So, the CH-

53E mishap rate is not as bad as you would be led to believe in the West Coast press.

That does not mean, however, that it is acceptable to us and that we are not concerned. Quite the contrary. We have challenged the contractor to do everything he can to make it a safer, more reliable machine, and we are looking at how we employ the CH-53E to remove as much as we can of the human factor.

It's true there is a lot more machine there than the UH-1N, for instance; but it's not too much for junior aviators, as you call them, if the proper amount of supervision in training, and scheduling is provided.

Approach: Continuing with the CH-53E, are we using the airplane for missions for which it was not designed? TERF, going up too close to the front with a plane of that size?

General Smith: Well, that's got several parts to it. The first is the airplane is easy to fly. I've flown it a number of times and found it a very honest airplane. You don't have to worry about it falling out of the sky. You give it the same treatment, from the pilot's standpoint, that you would give any other plane.

The nuggets' opportunity to train and fly successfully in the 53E is perfect. The people coming out of the Training Command are the best sticks we have ever seen in the fleet, bar none.

The things that get pilots in trouble in the 53E are the same things that will get them in trouble in any other airplane. They get outside the envelope of the airplane; they get outside the envelope of the person flying it and are not necessarily attentive to the signals the airplane is giving them that they're going too far.

Now, the mission, the primary mission of all the H-53s, A,D or E, is heavy lift: hauling things from Point A to Point B. The secondary mission is troop lift. There are some things you do in troop lift that you don't always have to do in heavy lift missions. And I think this is where we get the feeling that we're pushing too far forward for the design of the airplane.

If they are performing the heavy lift mission right, they have the right airplane for the right job. There are certainly opportunities to get outside the envelope of the airplane, not only from a technical standpoint, but from the mission's standpoint. And most of the time that occurs in the troop lift mission. So, as far as the exposure of the CH-53E to TERF and other missions, it's a big airplane; and the squadron commanders need to know what standards their pilots are training against and be absolutely decisive as to where they're moving the airplane. But according to the training standards we have in print, I believe the risk to be very, very low.

You're not going to see a 53E in a cargo mission doing much TERF. There is no requirement for it — terrain masking, maybe — but not TERF. I would say to the fleet, primary mission first, be absolutely certain you can do it; and then, the secondary mission, when you're tasked to do it, be certain you rehearse it, preferably in the simulator first.

Approach: You're speaking to both the first lieutenants and lieutenant colonels.

General Smith: The squadron commanders, flight leaders, co-pilots and crew chiefs, alike.

Approach: Are there plans for more CH-53E squadrons? The Marines seem to be buying more ground equipment — vehicles, guns.

General Smith: We require a minimum of six squadrons of 53Es for ship-to-shore missions of a MAF or MAB. In addition, two squadrons are needed to support the forces ashore, in what we call subsequent operations ashore. Right now, three squadrons are flying the Super Stallion and one is in transition. Subsequent budget work will be devoted to obtaining the next four squadrons. The objective is to replace all the Deltas with Echoes in the active force and outfit one reserve squadron with Echoes.

We will also try to arrive at our goal of less than 10 type-model series instead of the 20-odd we have now. In the 53 series, for example, we have As, A-pluses, Ds and Es. The

USMC TACAIR AND LAND FORCES SUMMARY

FY 1986	FY 1995	FY 2000
A-4M	AV-8B	AV-8B
AV-8C	"	"
AV-8B	"	"
A-4E	F/A-18A/C/D	F/A-18 C/D *
A-4F	" "	" "
TA-4J	" "	" "
TA-4F	" "	" "
OA-4M	" "	" "
F-4S	" "	" "
RF-4B	" "	" "
F/A-18A	" "	" "
A-6E	A-6E	A-6F/ATA
	A-6F	
EA-6A	EA-6B	EA-6B
EA-6B	"	"
KC-130F	KC-130F/R/T	KC-130T **
KC-130R	" "	"
KC-130T		
HH-46A	CH-46E	MV-22A
CH-46E	MV-22A	"
AH-1J	AH-1J	Multi-Mission Variant ***
AH-1T	AH-1W	" " "
UH-1E	UH-1N	" " "
UH-1N	UH-1N	" " "
OV-10A	OV-10D	" " "
OV-10D	"	" " "
CH-53A	CH-53A ?	CH-53E
CH-53D	CH-53D	"
CH-53E	CH-53E	"
TOTAL ****		
28	19	9 or 10

* CONSOLIDATE MISSIONS INTO EITHER "C" OR "D", BUT NOT BOTH.
** "F" AND "R" EXIST BUT UPGRADED TO THE "T" CONFIGURATION.
*** DEVELOP A MULTI-MISSION ATTACK/OBSERVATION/UTILITY VARIANT.
**** BASE SUPPORT, HMX AND ADVERSARY NOT INCLUDED.

training management alone is horrendous.

Combat capability will increase because we don't have to train people in so many different aircraft to perform a mission. And the logistics are greatly reduced, cut by more than half.

Approach: Marines were an important part of the Fleet during last year's deployments and combat in Libya. Marine squadrons helped introduce the F/A-18A Hornet in combat, and VMAQ 2 did yeoman ECM service on short notice. What are a few of the findings from these recent deployments regarding the specific aircraft and the Marine role aboard Navy carriers?

General Smith: Fighting alongside sailors is a role deeply seated in our Marine Corps heritage. Last year's deployments with the Marine F/A-18 and the EA-6B once again showed our readiness to accomplish any assigned mission. Our Marine pilots and troops in VMFA 314 and VMFA 323 performed all the same tasks as their sister Navy squadrons, and they performed superbly in the air, on the flight deck and in their spaces.

The EA-6B deployment was especially challenging because VMAQ 2 had only 40 days to form a shipboard detachment, conduct FCLPs, carrier qualify, and make aircrews and maintenance personnel ship smart. During the deployment, Marine EA-6Bs performed all EW missions while demonstrating their unique ECM capabilities by integrating the Tactical Electronic Reconnaissance Processing and Evaluation Systems (TERPES) with the ship's CVIC.

On the lighter side, Marines enjoyed the challenge to outdo their Navy comrades in zone inspections, shore patrol details, conduct on liberty and looking sharp around the ship.

Approach: At the Tailhook Convention last year, SECNAV stated that more Navy air wings will deploy with Marine squadrons — A-6, EA-6B, F/A-18A — while Navy squadrons recently deployed with Marine Air Groups in Japan. What do you see in terms of interoperability in the future?

General Smith: With the growth of the 600-ship Navy and resultant 15 deployable carriers, Marine squadrons aboard CVs will continue; we have been doing that since 1931.

Approach: Could you comment on the increased presence of AV-8Bs on LHAs and LPHs? Is this now SOP air wing structure? What about the safety aspect of a mixed fixed-wing/helo wing?

General Smith: There is really no increased presence of AV-8Bs on LHAs and LPHs. We have been operating these aircraft with our Marine Amphibious Units (MAUs) since 1974. With the transition of all our VMA squadrons to the AV-8B, we have more of this particular model now available for deployment.

Our plans call for deploying a detachment of AV-8Bs when our MAUs go out on LHAs and for having a contingency detachment available for LPH MAU deployments. Other than requiring more attention to detail, we don't feel that mixing fixed- and rotary-wing aircraft presents an insurmountable challenge.

In closing, in this, the 75th year of Marine Corps aviation, I'd like to say to your readers: Redouble your efforts to be combat-ready safely so that the effort of all our predecessors will not have been in vain, and so we can ensure the legacy for those who follow us. ◄

Joe Plummer

Lessons Learned

By the Griffins of HMM 266

DURING our annual training cycle, we found ourselves in such diverse training locations as Twentynine Palms, Calif., in August (mean high temperature — 103.1 degrees Fahrenheit); Bridgeport, Calif., in September (landing zone elevations from 6,700 to 10,000 feet MSL); Volk Field, Wis., in January (mean high temperature — *cold*); and northern Norway in March (don't ask). For a helicopter squadron ostensibly home-based in coastal North Carolina, we had to deal with some interesting operational and logistical problems.

TRANSCON. To get a squadron of 12 CH-46 helicopters from North Carolina to California, we had a choice of either a logistical nightmare or an operational nightmare. The former would require tearing the aircraft down and stuffing them in Air Force C-5s. The latter involved flying the aircraft cross-country. Of course, either way was a maintenance headache. We chose the operational nightmare.

LCpl L. Wainscott

TRANSCON: A choice of either a logistical nightmare or an operational nightmare. For us, the logistical nightmare of breaking down our CH-46s for transport as shown here was the worst of the two nightmares. We opted for the operational nightmare of flying the squadron to California.

. . . Out west where the only inhabitants are horned toads and gila monsters, we thought our only threat would be an aircraft malfunction requiring landing in some Godforsaken location. A new threat presented itself when a flight of F-15s passed below us . . .

The ops folks selected the route of flight and "locked in" a C-130 chase aircraft. Hopefully, your squadron transcon will have a high enough priority so that the C-130 **actually launches** when you need it. In our case, *each* pilot studied the route of flight to determine primary and back-up navigational aids. (Dash Three never really thought that he would get the lead in the middle of a divert around weather.) While VFR in mountainous terrain below TACAN reception altitude, the low freq ADF and water towers made good navigational cross-checks. The ADF also gave a poor man's weather radar. Wherever lightning struck, the ADF quickly pointed in that direction, and we knew that we didn't want to go that way!

Out west where the primary inhabitants are horned toads and gila monsters, we thought our only threat would be an aircraft malfunction requiring a landing in some God-forsaken location. A new threat presented itself when a flight of F-15s passed below us. The Sandblower Routes are very active, and invade the traditional helicopter domain below 1,000 feet AGL. Of course, since both fixed-wing aircraft and the helicopters are painted to blend in with the background, the chances of seeing one another are greatly reduced. Heads up!

Deciding that it would be more comfortable at a higher altitude (cooler, and without sandblowers), we climbed to an appropriate VFR cruising altitude. We were flying loose cruise with the usual stepup sight picture. Dash Last was somewhat concerned when he noticed that he was close to an IFR cruising altitude as we crossed a Victor Airway. If you are going to spread out horizontally, ensure that you don't spread out vertically as well.

THE STUMPS. Arriving at the Expeditionary Airfield West, we knew this was one of those places where we hoped we wouldn't have to land. (And we were going to stay here six weeks!) Other than being hot and dusty, with general purpose tents as the only accommodations, it was a veritable paradise.

It took a little time to become acclimated to the desert heat, even though we were used to the coastal Carolina summers. The first couple of days were characterized by acute lethargy. We knew we were finally acclimated when we climbed into our sleeping bags at night because we were cold and it was

only 75 degrees.

Heat casualties were one of our greatest worries. However, our only heat-related injury was a strained shoulder from patting ourselves on the back for not having any heat casualties. Something must have worked. Before departure, all hands had received the heat stress lecture as a part of the Second Marine Aircraft Wing aeromedical safety brief program. This lecture alerted all of us to the hazards, symptoms and prevention of heat stress. One preventive measure was to ensure a bountiful supply of water. Five-gallon water cans were kept on each aircraft. Metal thermos bottles were issued to most of the aircrews. Those aircrew who did not have the bottles carried canteens. All of these water containers were useless unless there was a *convenient* and plentiful supply of cool water.

The squadron solved the problem by bringing lister bags, which are oversized seabags with six faucets. They kept water cool by evaporation in the same manner as a desert "swamp cooler." We placed one bag in our hangar and one outside our ops hooch. Without them, we would have been up the creek — if Twentynine Palms had enough water for a creek.

We tried to do most of our maintenance in the early morning or in the late evening and night. Although life did not come to a screeching halt at noon, it definitely slowed down. Remember that it was the people of the Southwest who invented the siesta.

In addition to the siesta, we discovered other methods of coping with the desert heat. A general purpose tent came as close to absorbing all of the sun's energy as anything that modern scientists have developed. Unfortunately, all of that energy was radiated into the tent living space.

We found that creating a suspended ceiling of ponchos kept the heat well above our heads. These "air conditioners" worked well enough for us to vow to bring the white tent liners on all future deployments. We also found that the tents did not heat up as much when they were shaded. Next time (which will be much too early), we will erect camouflage netting over our tents.

Harriers come with a megabuck umbrella to protect the cockpit from the sun. Next time we will bring windshield shades made from reflective paper. If it's good enough for every car in the desert, it should be good enough for our helicopters. For our final defense against the heat, we brought a hand-cranked ice cream freezer and had homemade ice cream every other day. Just because we were in the middle of the Mojave Desert doesn't mean we had to be ultra-uncomfortable!

During the past five years, there have been several mishaps caused by dust and sand clogging the full barrier filters of the engine inlets. To avoid this, we cleaned our full barrier filters every night. We got shoulder strain from patting ourselves on the back for that one, too.

To most operators, expeditionary meant that if you hadn't brought it, you weren't going to get it. Fortunately, NARF North Island and MAG 16 at Tustin were close enough for us to beg, borrow and steal parts. Relying on the normal supply train 2,500 miles to the rear required an undue amount of faith in Federal Express. Some parts were too big or heavy for them to ship. (By the way, if you happen to see a clamshell access panel . . .)

Whenever a unit deploys for an extended period of time, it takes along its intermediate maintenance support. Our avionics support was housed in two mobile maintenance facility vans. These two vans contained all the benches necessary to support the squadron. The vans were loaded on air-cushioned flatbed trucks in North Carolina, off-loaded at Twentynine Palms and reloaded on trucks for the departure. Considering the cost of the avionics vans, next time we will try to keep the vans on the flatbed for the entire deployment. Just the thought of one little slip of a crane is enough to justify the additional expense. It came down to a dollars and sense decision.

PPPPPPP. Newton's First Law also applies to bureaucracies: "A body at rest tends to stay at rest." Don't believe what "they" said they would do for you, especially if it involves transportation or cranes. Your guaranteed big truck, little truck and jeep may turn out to be hard down 75 miles away. If it is really important to you, stay on the problem until it is resolved in your favor.

Before this deployment, the Griffins did a novel thing. We read the after-action reports and mishap reports from previous deployments. We made enough mistakes to submit a good sized official after-action report, but at least we made new mistakes, rather than repeating the old. This was the result of proper planning.

In any training exercise, higher headquarters must support the squadron training program. The tremendous cost in aircraft, personnel and financial assets to deploy an East Coast helicopter squadron to California must be offset by equally tremendous increases in combat readiness. When manning squadrons and higher headquarters for deployments, accept the counsel of Hallmark: "When you care enough, send the very best." We'll see you there. ◄

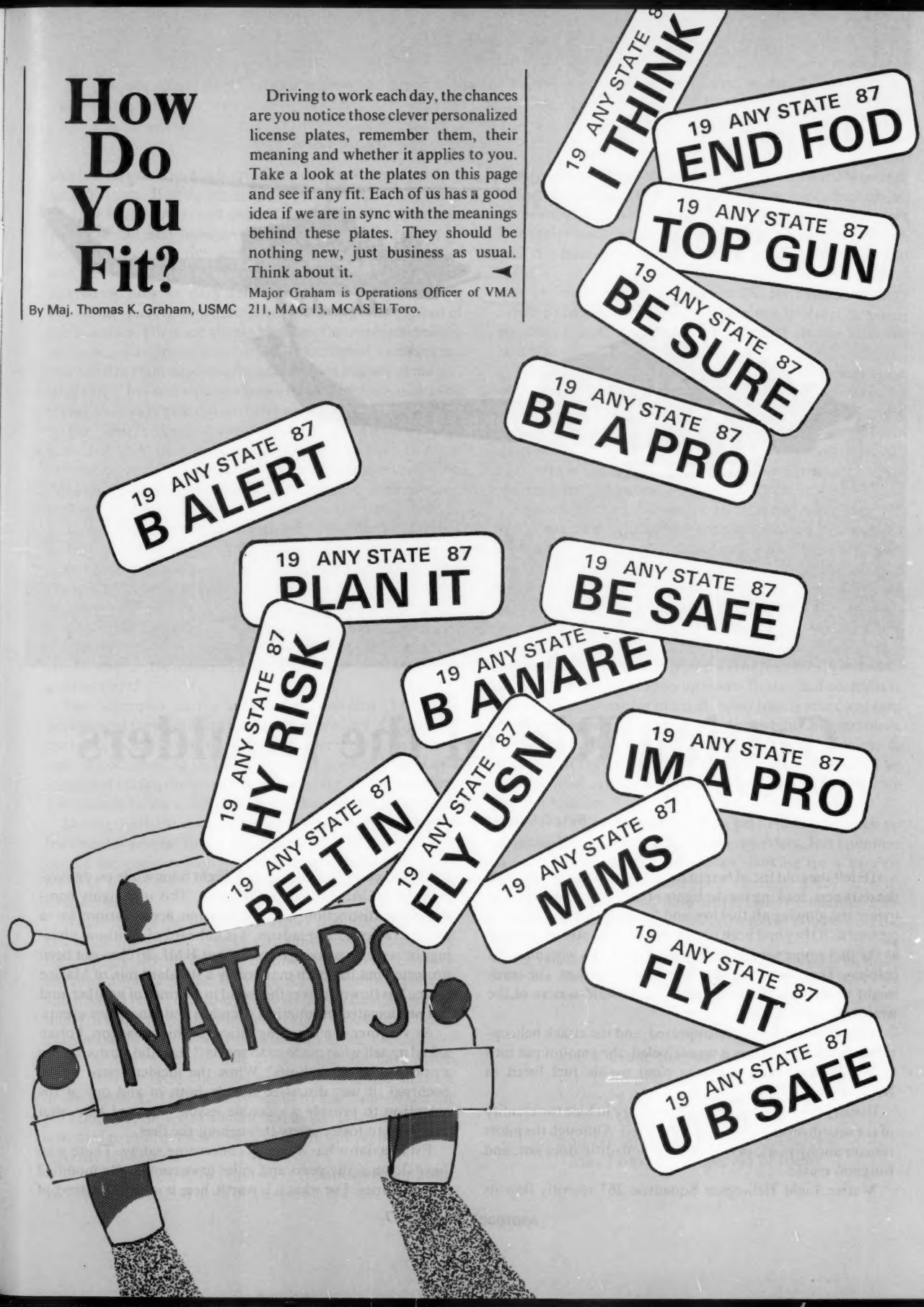
The Griffins of HMM 266 are led by Lt.Col. Craig Steinmetz and Maj. Billy Hunt. The aviation safety officer is Maj. Joe Schmid. The unit is a Marine medium helicopter squadron under MAG 26, 2d MAW. — Ed.

How Do You Fit?

By Maj. Thomas K. Graham, USMC

Driving to work each day, the chances are you notice those clever personalized license plates, remember them, their meaning and whether it applies to you. Take a look at the plates on this page and see if any fit. Each of us has a good idea if we are in sync with the meanings behind these plates. They should be nothing new, just business as usual. Think about it.

Major Graham is Operations Officer of VMA 211, MAG 13, MCAS El Toro.



Getting Rid of the Boulders

By Lt.Col. William S. Lawrence, USMC

HE felt the cold fist of fear in his belly as he peered through the darkness, looking for the lights of the runway. He tried to ignore the glowing aft fuel low and forward fuel low lights; it seemed as if they had been on forever. He was still over water as the fuel gauge needle crept toward zero. His wingman felt helpless. There was no way to help him fly farther. The crash might be survivable; but at night in the cold waters of the winter sea, there was little hope.

At last the runway lights appeared, and the attack helicopter landed safely. When it was refueled, the amount put into the tanks was more than the total usable fuel listed in NATOPS.

Usually these stories, although true, try to hide the identity of the squadron and individuals involved. Although the pilots remain anonymous, in this case the squadron does not, and for good reason.

Marine Light Helicopter Squadron 267 recently flew its 100,000th class "A" mishap-free flight hour while on deployment to MCAS Futenma, Okinawa. This is a highly commendable distinction for any aviation organization; for a tactical helicopter squadron, it is unheard of. Without abusing the issue, it is enough to say that HML 267 has not been protected but has been manned by a standard mix of Marine pilots, has flown all over the world in all kinds of weather, and has participated in countless exercises and innovative events.

As a former commanding officer of this squadron, I often asked myself what made us so special? How did we manage to avoid the smoking holes? When the incident cited above occurred, it was discussed openly both in and out of the squadron to provide a valuable lesson, repeated here, that may help to foster safety throughout the fleet.

Every aviator has a theory concerning safety. Those who have flown many years and miles have continually modified their theories. For what it is worth, here is mine. The street of

. . . The sky grew dark. Iwakuni seemed impossibly far away, and the fuel dwindled to an unacceptable low level . . .

safety is strewn with boulders. Trip on a boulder and you lose your balance. If there are enough boulders in the way, and you trip over another and another, you become so off balance that you fall and have an accident. But if the number of boulders is few and they are small, you can trip once or twice and recover. The number and size of boulders on the street is altered by how we plan and fly. If we carefully plan and coordinate and fly our coordinated plan, we get rid of most of the boulders. There are always boulders that we cannot eliminate. Some tripping is inevitable. Occasional catastrophic mechanical malfunctions are outside of the bounds of normal prediction, but we can lessen the size of even these boulders by trying to always give ourselves an out.

The flight in question was a section of two AH-1J helicopters filed VFR from Okinawa to Iwakuni with an en route refueling stop at Tokunoshima. The section leader was hand-selected by operations for his maturity and demonstrated good judgment — an attempt to sweep the street clear of boulders. His wingman in the incident helicopter was a senior staff pilot with a great many flight hours. His co-pilot was also a staff pilot with moderate fleet experience. The incident was the subject of an informal investigation, during which several facts emerged.

The flight launched late due to maintenance problems. Therefore, although originally planned for daylight, the flight would end in the dark. Hardly a boulder — just a small pebble, right?

The helicopter had a known fuel problem. The valve between the forward and aft fuel cells was balky. Topping off the tanks took a long time — not a boulder unless you make it one. When refueling en route, the pilot grew impatient and instead of taking the extra five minutes, cut off the fuel some 150 pounds below a full load. Roll a boulder onto the road.

During the flight, control was passed between the pilot and his co-pilot several times. Practicing close formation flight caused fuel consumption to be higher in the incident helicopter than in the lead — a preventable boulder that was not considered.

Winds during the flight were higher than forecast, which decreased the ground speed — an unforeseen boulder. The flight progressed, but the incident pilot, who was not conducting time-distance or fuel burn checks (two more boulders), and who did not have a go-no go point (throw another one out there), did not recognize the danger signs. His section leader did not ask for fuel checks and wasn't concerned. One boulder from the section leader. The co-pilot did not have a fuel gauge, was not cross checking navigation, and was unaware of the problem. The boulders began to stack up. When the pilot finally admitted to himself that he was in trouble, he was reluctant to inform his section leader. He was becoming dangerously off balance.

The sky grew dark. Iwakuni seemed impossibly far away, and the fuel dwindled to an unacceptable low level. The pilot finally informed the section leader that **he had but 200 pounds of fuel remaining**. (He was finally trying to kick a boulder off of the road.) The AH-1J NATOPS requires being on the deck with 200 pounds remaining. It was still 20 minutes to Iwakuni, and 200 pounds is enough fuel for perhaps 20 minutes of flight.

It was night, visibility was poor and the rugged southern Japan coastline was no place to attempt a landing. All possible diverts had now been left far behind. It was time for payback.

The pilot adjusted power and airspeed to maximum range while lead climbed to get a TACAN lock-on for a direct cut to Iwakuni. (Pick up the broom.) Fortunately, the fuel gauge was inaccurate enough in the right direction that the flight ended without incident. (Kick that fatal boulder off the road.) Had not the flight declared emergency fuel, the story might not have become public.

Any one of these factors, or even several taken together, would not have created the environment for an inevitable accident. As it was, there were enough boulders in the path that one more might have been fatal. Had the head wind been 5 knots more, if NAVAIDS had failed . . .

The product of a casual attitude is carelessness. RAdm. Jack Ready, a past Commander of the Naval Air Test Center, sums it up like this: "Fly smart, stay half-scared and always give yourself an out." To fly smart is to plan the flight and fly the plan. Look for boulders up front. To stay half-scared is to never take anything for granted, never totally relax and take immediate action when there is the possibility of a problem. Recognize boulders when they appear. Do not become so relaxed that they sneak up on you. Always give yourself an out — a smart aviator **always** has a cushion, a way to sidestep the next boulder.

Has HML 267 been lucky? You bet. There have been no unforseeable, unavoidable, massive boulders. But countless hazards lurking around the corner, looking for a careless slip-up, have been sidestepped through a lot of self-examination, sweat and hard work. Safety-conscious individuals in the squadron have kicked a ton of boulders off the road. ◄

Lt. Col. (colonel select) Lawrence is V-22 program manager in the Rotary Wing Test Directorate, Naval Air Test Center, Patuxent River, Md. Previously he was CO of HML 267, 3d MAW.

If those boulders continue
to pile up, remember
1-800-HOT-SFTY
is our safety hot line
and our answers to your questions
may help you to get rid of them.

. . . Heading back to the field, I wondered if the airplane was going to hold together long enough. Was there really an oil problem? This was the first time I'd really ever been worried by a failure. I took my kneeboard off and tightened all of my straps more than I had ever done before . . .

There I Was

By Capt. Charlie Wright, USMC

THERE I was with this little old 20 percent oil low light on. I thought it was lying, but just in case it wasn't, I set the power at 87 percent RPM and headed back to the field.

I was an ACM instructor and PMCF pilot with nearly 1,500 hours in the TA-4J aircraft and nearly 1,000 missions over south Texas. I thought I'd seen everything there was to see in the training command; nothing could possibly take me by surprise. I had lost count of the number of times I had been NORDO, experienced generator failures, hydraulic failures and even 20 percent oil lights due to electrical problems; but I had always gotten back.

Fifteen minutes into the flight and I had just checked the oil quantity. The pressure was steady at 45 PSI. It was a nice clear day to be flying, and everything was copacetic. A few seconds later, the 20 percent oil low light illuminated. I thought it must be stray trons; no big deal. I'd seen this before. I set the power at 87 percent and started a turn back to the field to make a straight-in precautionary landing in accordance with NATOPS procedures.

When those of us who fly single-engine aircraft take off, the best we can possibly hope for is a single-engine landing. (I thought I would mention that for all you multiengine types.) I can remember when I use to fly the F-4 with it's two J-79s. The thought of an engine problem rarely crossed my mind. However, in the TA-4, that thought had crossed my mind; and I frequently practiced straight-in precautionary landings just in case.

A few seconds later the oil pressure dropped from 45 PSI to six PSI. Now I was thinking, "Oh, oh!" It had my full attention as I stared at this little peanut-sized pressure gauge that had not only become very important, but now had grown to basketball size as I stared at it. I wondered where the oil pressure went and what sort of stray trons caused the problem.

When I finally accepted the fact that this was happening, I got mad and asked: How can this airplane do this to me? Why don't I have two engines instead of just one?"

Then reality arrived, and the name of the game was to survive and do whatever it took to get back. Out of nearly 5,000 hours of flight time and numerous emergencies of all types, this was the first time I thought that I might not get the plane back. The thought of ejecting

was not a fun one, but when there was no other choice to make, you have to pull the handle and you're out of there.

Heading back to the field, I wondered if the airplane was going to hold together long enough. Was there **really** an oil problem? This was the first time I'd ever been **really** worried by a failure. I took my kneeboard off and tightened all of my straps more than I had ever done before. I stared at the oil pressure gauge — still at six PSI. (Does anybody **really** know how long the J-52 engine will run with no oil?) As I recalled some of the old hangar flying stories of the ready room, 10 minutes seemed to be the agreed figure. (I hoped it ran for at least 10 **more** minutes as I descended through 10,000 feet, 25 miles from home, doing 375 knots.) It didn't seem to be nearly fast enough to get me there in time.

Five miles southwest of the field at 1,000 feet, aiming at a modified entry into a left base for 35L, I started to believe that I was going to make it. On base the boards came out, the power remained set at 87 percent, and at 2½ miles, we were lined up on the runway with gear down and 225 knots.

I hit the final check point at 200 feet AGL, 200 knots and 1,000 feet from the end of the runway. Everything was looking good. I pulled the power back to idle and started to flare with a nice smooth touchdown about 1,000 feet down the runway. It was a good feeling as I slowed down, cleared the runway and stopped for the crash crew to pin my gear. With oil pressure at four PSI, I shut down the engine.

Climbing out, I looked back and could see black smoke pouring out of the airplane. The crash crew was poised at the tailpipe, watching a small oil-fed tailpipe fire slowly flicker out. The tailpipe was covered with engine oil, and I knew for certain I had been lucky.

Post-flight inspection found a catastrophic failure of the No. 6 oil bearing, with oil leaking out at a very high rate. The engine would not have run much longer. I had been **very lucky** to have gotten back. But I'd rather be lucky than good anytime. Knowing and following NATOPS procedures and deciding quickly to set the power and head home probably made the big difference.

I learned that if you have a warning light and you think it's lying, don't bet your life on it. You never know. I also discovered that the J-52 engine will run for at least 10 minutes with little or no oil pressure. Finally, I learned to keep practicing those precautionary landings and *always* be ready for the unexpected.

Capt. Wright flies for H&MS 31, MCAS Beaufort, S.C.

Safety

In its element, a Harrier II of VMA 331 flies low over the desert Southwest.

WHILE the Harrier II is establishing an enviable reputation, there are areas to consider in the introduction of any new aircraft, such as the ongoing subject of safety. Approach visited MAG 32 to see how the Cherry Point Marines are safely introducing their new aircraft to the fleet.

In 1977, the AV-8A's mishap rate was 66.45 through 15,000 flight hours and 10 Class A mishaps. In 1981, the rate was 59.71 through 11,723 flight hours and seven Class As. The AV-8B's mishap rate certainly compares favorably to that of the A at this point. In the first 25,000 hours of flight time, the AV-8A's rate was 23.08, while the B's rate was 15.11. The AV-8A's mishap rate was one of the highest for current generation jets, however, the Marines' hopes for the AV-8B are high since the Harrier II enjoys many improvements over the A.

LSOs observe a VMA 231 AV-8B conducting FCLP at Bogue Field.

and the AV-8B

Approach Visits MAG 32, Home of the Harrier II

By Peter Mersky

Perhaps the most important changes in the B when compared to the A are the 14 percent increase in wing area, the incorporation of lift improvement devices (LIDs) under the fuselage, and leading-edge root extensions (LERX). The LID "fence" forms a "box" which traps additional lift, enabling the B to carry as much as 1,000 more pounds, either in fuel or ordnance.

The Harrier II's flaps have also been improved, with greater area and incorporation with the aircraft's engine nozzles to induce airflow over the wing for greater lift.

The AV-8B's rear fuselage has been lengthened by 18 inches for better longitudinal balance, and the cockpit has been raised 10.5 inches for improved visibility, which helps around the ship and confined field sites.

The B's avionics include an angle rate bombing system (ARBS), stability augmentation and altitude hold system (SAAHS), and an inertial navigation system (INS) which enables the Harrier pilot to deliver ordnance on an unfamiliar target. The INS is considered by many AV-8B aviators to be the biggest factor in the growing confidence in low-level operations. There is also a six-power TV camera incorporated into the ARBS, as well as the newly-developed Hands-on-Throttle-and-Stick (HOTAS), similar to the installation on the F/A-18.

Capt. G.E. LeBlanc, training officer for VMAT 203, notes, "The SAAHS makes flying the aircraft a lot easier than the A. It gives the controls more authority, allowing the pilot to 'fine tune' his approach. For instance, out-of-wind adjustments are made automatically, making the B much easier to hover. In the A, the pilot did *all* the work."

MAG 32 pilots are enthusiastic about their new aircraft, and Lt. Col. Ben Mayer, then the group's Director of Standardization and Safety, now the S-4 Logistics Officer, says, "The AV-8B is a more solid-feeling airplane, a much smoother aircraft in the VTOL regime, when compared to the A."

Along with the second-generation Harrier, the Marines introduced an advanced flight simulator, the McDonnell Douglas 2F133 Operational Flight Trainer (OFT), which is a

Below, an AV-8B demonstrates its adaptibility to operating conditions by landing on a road during field exercises.

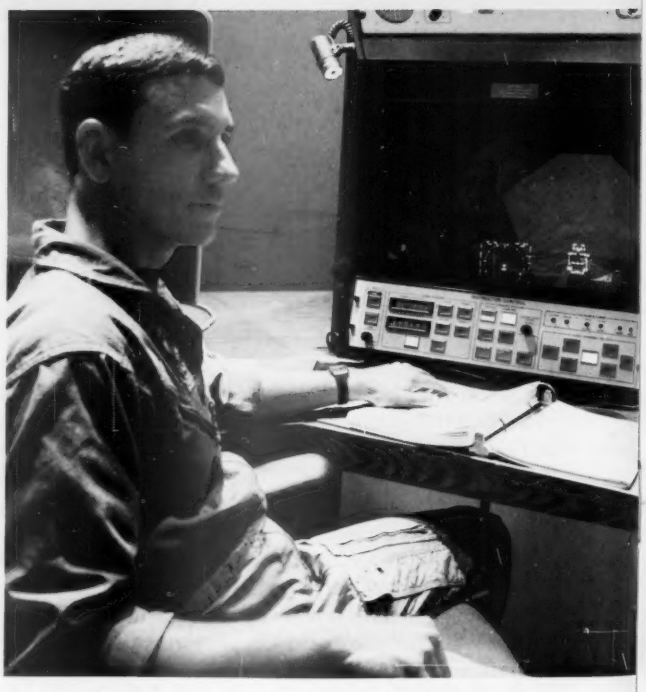
Below, the raised cockpit and increased visibility of the AV-8B are evident in this view.

big factor in reducing problems transitioning from conventional fixed-wing aircraft. Another factor is the cadre of V/STOL-experienced aviators with AV-8A time.

Capt. LeBlanc says, "With the AV-8B OFT, we can take a guy who just got his wings and teach him to fly the B, something we simply couldn't do before." Originally, as part of the AV-8A conversion syllabus, there was a helicopter conversion segment involving CH-46 flight with qualified helicopter instructors, which introduced prospective Harrier pilots to the peculiarities of V/STOL flight. These flights have been discontinued with the introduction of the AV-8B and the 2F133 OFT. The ground simulator allows visual correlation with the gauges to external environments, thereby replacing the helo hops, and provides transitioning pilots the opportunity to get used to the unique V/STOL-hover characteristics of the Harrier. The previous trainer for the AV-8A had no ability to simulate the V/STOL hover regime of flight so crucial to the Harrier. Inside the cockpit trainer, the depiction of the external environment is incredibly realistic.

From a safety standpoint, the new generation of simulators has given training a quantum leap in capability. The feel and appearance of these devices bring a student closer to his aircraft, its systems and its peculiar flight regimes before he experiences the real thing. The flight simulators represent a considerable improvement in making the transition from simulation to actual flight not such a great leap.

Col. D.T. Savage, commander of MAG 32 agrees, "With



This example of the presentation (top) and view of the instructor's station (bottom) of the McDonnell Douglas OFT show the great strides in simulators over the last decade.

The power plants shop of H&MS 32 is responsible for maintaining the Rolls-Royce Pegasus engines of the AV-8B. The Pegasus is assembled vertically, the only engine so designed, which allows for ease of maintenance.

VMA 231 aviators consult performance charts during preflight planning.

the new ISD — Instructional Systems Development — and simulators, we've tripled VMAT 203's output." The ISD concept takes advantage of the latest technical and psychological research available and applies it to all phases of the training cycle. Touching on operational safety, Col. Savage commented, "The flight characteristics of the B enable a young aviator to go to the ship more quickly." Col. Savage expects more shipboard deployments with the B, as well as an increased level of night operations which were limited with the AV-8A.

Headquarters and Maintenance Squadron (H&MS) 32 is responsible for the intermediate maintenance effort associated with the new Harrier, including the care of the three variants of the Rolls-Royce Pegasus engine. Great things are expected from the new 406A Pegasus, which will offer a digital engine control system.

Basic construction of the huge Pegasus engine has not changed from the AV-8A to the B, but constant attention to detail has increased the power plant's dependability. The Pegasus allows vertical as well as conventional forward flight on one engine.

VMA 542 is the latest fleet squadron to transition to the AV-8B. Commanding Officer Lt. Col. J.W. Cox is among the most senior Harrier aviators in the Marine Corps.

"The COs are aware of the safety record of the A," he says, "and we're very concerned about not repeating the same mistakes." There was a period in the mid-70s when not all COs of Harrier squadrons had V/STOL experience. Many skippers transitioned to the Harrier after their arrival at their new command. Noting the improvements of the B, Lt. Col. Cox added, "The B turns better, is more comfortable in the pattern and exhibits better low-speed handling."

The indoctrination of AV-8B support personnel begins with FRAMP (Fleet Readiness Aviation Maintenance Personnel) training. Phase I of FRAMP includes a general indoctrination to GSE and aviation safety, including ejection seat safety, proper grounding and chocking of aircraft, and FOD awareness.

Naval Air Maintenance Training (NAMTRA) follows Phase I and includes sections on the AV-8B itself. It is in this area that the biggest strides have been made in FRAMP training. The Marines have what they consider to be state-of-the-art ground trainers in three specific areas: ejection seat, fuel systems and power plants.

"There's nothing like it in the Navy or Marines, and possibly the Air Force," says CWO2 Tom Norman, Assistant FRAMP OINC. The trainers are impressive and give the FRAMP student an opportunity to track fluids through the various systems, and get hands-on training on the ejection seat on a full-scale mock-up of the forward fuselage of the B.

In addition to these static trainers, FRAMP uses an actual Harrier II drawn from one of the squadrons of MAG 32. These Bs are not old, weary aircraft, but brand-new, fully-flyable AV-8Bs. FRAMP holds the aircraft for 60 days, then returns it to the squadron in restored condition.

The impact of the improved FRAMP training is indicated by the fact that as little as 30 days after leaving FRAMP and joining a squadron, many individuals qualify to go before Plane Captain Boards. More rapid utilization of the individual's training increases the actual time that he is of value to the squadron.

The AV-8B Harrier II promises to be one of the Marine Corps' most important aircraft. The unique concept of V/STOL, and all it implies for the battlefield commander, places the AV-8B in the forefront of weapons system development.

Whatever is in store for the AV-8B, it seems certain that the Marines have committed every asset toward safely and expediently bringing the B to full operational readiness. ◄

Peter Mersky is a staff writer for Approach.

. . . The CH-53 was not visible until I scanned left and saw my rotor blades turning over the top of the CH-53, and his blades were bouncing up and down barely missing my wing stub . . .

Taxi To . . .

By Capt. M.D. Protack, USMC

THE mission was routine enough: a flare drop and simulated close-in fire support (SIMCIFS) mission in support of a Marine Battalion MCCRES. Brief time was posted as 0200.

An attempt at a pre-mission brief was difficult since the battalion was already in the field when I got the frag. The typical response from the fragger was to wing it. He said, "Everything will be OK." We planned that one section would drop flares for illumination while the other provided SIMCIFS. Man-up and start-up were no problem for a 0330 takeoff for uploading and arming.

We called to taxi about 0330. No particular taxiway was requested since two taxiways were available, both the same distance from the arming area. Though the normal route was via the Brávo taxiway, "Ground" came back with "Viper 24, flight of four, taxi to the arming area via the Charlie taxiway." No problem, the flight was ready, and I picked up and headed south for the Charlie taxiway. About 100 feet from the hold short line, the ordnance crew lights were barely visible on this zero illumination night. Another 50 feet and I switched to tower frequency when my co-pilot screamed, "There's a 53 out there!"

Being more than slightly surprised, I stopped taxiing and jumped on the UHF radio for the flight to halt. The CH-53 was not visible until I scanned left and saw my rotor blades turning over top the CH-53, and his blades were bouncing up and down barely missing my wing stub. The margin for error was about zilch point zero. At about five seconds past the initial ID, Ground asked if I needed any assistance. I promptly thanked them for their "heads up" on the unlit CH-53 on the taxiway. His curt response was, "Roger, Viper 24." I taxied to the right and continued to the arming area, intent on getting this mission over with as soon as possible.

After some discussion in the arming area, we decided to press on, even though the weather didn't look all that great in the impact area. Initial contact with the force in the field took forever, and we had to orbit as briefed. After a couple of turns, I noticed some of the positions and airwork weren't all that Sierra Hotel, so I stacked the sections with 500 feet in between for separation.

(After the mission, I found out that the Cobra RAG had stopped flying night formation some months before. That meant none of the co-pilots flying rear seat had flown any night formation during their short careers in naval aviation.) At any rate, I finally got through to the air officer on the ground, and he requested two things we couldn't do: drop flares off the impact area and fly our mission below 200 feet so the battalion could see us.

The first request violated range regulations, and the second one violated a wing order requiring night vision goggles for TERF evolutions at night. Needless to say both requests went against common sense as well. We did some 500 feet AGL target runs, and broke off to complete a flare drop which, at this point, I had almost forgotten about. We dropped all ordnance and went home without incident.

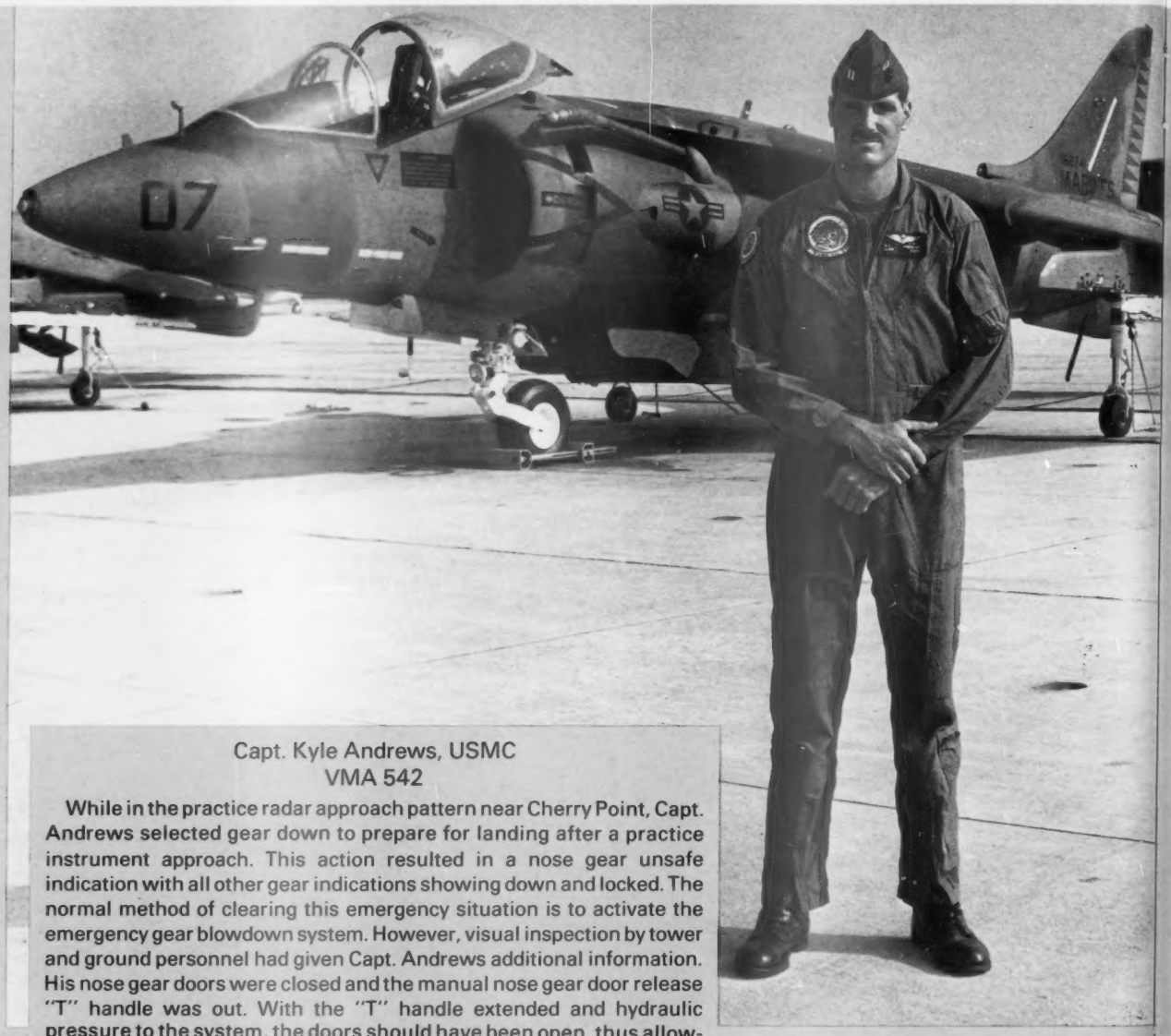
This 90-minute flight contained all the preliminaries of a Class A mishap. Worst of all, the contributing factors were all externally introduced into the flight. Only a bit of luck and some sound judgment by all in the flight saved us. Let's examine the "gotchas":

- The unlit CH-53 should not have been on the taxiway, and ground personnel should have known that it was there.
- I wasn't told that the co-pilots flying rear seat had never flown night form, and I briefed as if they were capable to perform this mission.
- Finally, the people trying to talk me into a mission profile we were not allowed to fly was the final straw. At some point everybody has to call "knock it off" when things just aren't going right.

The moral of the story is "there is no such thing as a benign environment involving flight." Furthermore, at night use twice the caution and half the speed.

Capt. Protack is aviation safety officer and an AH-1T pilot with HMA 169, MAG 39, 3d MAW. MAW, MCAS, Camp Pendleton, Calif.

B Roder



Capt. Kyle Andrews, USMC
VMA 542

While in the practice radar approach pattern near Cherry Point, Capt. Andrews selected gear down to prepare for landing after a practice instrument approach. This action resulted in a nose gear unsafe indication with all other gear indications showing down and locked. The normal method of clearing this emergency situation is to activate the emergency gear blowdown system. However, visual inspection by tower and ground personnel had given Capt. Andrews additional information. His nose gear doors were closed and the manual nose gear door release "T" handle was out. With the "T" handle extended and hydraulic pressure to the system, the doors should have been open, thus allowing the gear blowdown to work. If the nose gear was mechanically restricted from coming down, blowing the gear down (NATOPS method) would have no effect, thus committing the aircraft to a vertical landing with the nose gear up and other gear down. The decision was made to retract the down gear and land gear up since previous Harrier landings with the nose gear up and the main gear down have resulted in extensive damage to the aircraft.

Capt. Andrews then maneuvered his AV-8B to the landing pad and performed a flawless vertical landing on the belly strakes resulting in minimal damage to the strakes and no damage to the aircraft.

BRAVO ZULU

Capt. John J. Harvey, USMC
Ens. Thomas J. Coogan
HT 8

Capt. Harvey, an instructor pilot, was conducting a basic familiarization flight with his student pilot, Ens. Coogan. At an altitude of 700 feet and an airspeed of 100 knots, Capt. Harvey rolled the twist grip of his single-engine TH-57C Sea Ranger to flight idle, simulating a loss of power. As Ens. Coogan performed the appropriate emergency procedures, Capt. Harvey heard the engine-out warning horn. A quick scan of his engine instruments confirmed that the engine had actually flamed out.

Capt. Harvey immediately took control of the aircraft, transmitted a Mayday call and executed a flawless zero-ground speed autorotational landing. He accomplished this under the extremely demanding conditions of high aircraft gross weight, high density altitude, low recovery altitude, negligible wind and only a small, recently cultivated farmer's field in which to land. There was no damage done to the aircraft during this full autorotation.

Capt. John J. Harvey (left), Ens. Thomas J. Coogan (right).

Continued

Capt. Dave Miller, USMC
1st Lt. Joe Scully, USMC
VMA(AW) 242

Capt. Miller (pilot) and 1st Lt. Scully (BN) were flying the lead aircraft in a section close air support mission with live ordnance from MCAS El Toro, Calif. The section launched at 0710 making simultaneous takeoffs on dual runways 07 left and right.

Immediately after rotation and initiation of landing gear retraction, their A-6E experienced several loud thumps followed by loss of thrust and decaying rpm and fuel flow on the starboard engine. As the aircraft began to settle at 50 feet AGL, Capt. Miller immediately jettisoned his 6 MK 82 bombs, 6 MK 76 practice bombs with the associated MER and TERS, and two full 300-gallon fuel tanks. He then continued the "engine fire/failure takeoff continued" NATOPS procedure by closing the engine bleed air gangbar, establishing single-engine climb AOA and initiating fuselage and wing fuel dump. 1st Lt. Scully assisted by cross-checking engine instruments, airspeed and VSI indications. The wingman informed the crew that the aircraft appeared to be experiencing rapid compressor stalls, and that flames were coming from the right tail pipe. Capt. Miller and 1st Lt. Scully were acutely aware that bumper-to-bumper morning rush-hour traffic on a major public road crossed their flight path several yards beyond the perimeter fence, and elected to remain in the aircraft. The starboard engine was secured as soon as single-engine flight was assured. They climbed to a safe altitude and, assisted by their wingman, circled clear of populated areas to return for a safe single-engine, arrested landing.

The investigation revealed that an internal engine failure had severely damaged the engine turbine section, and that the expeditious shutdown of the engine probably prevented catastrophic failure and significant aircraft damage or loss. The instantaneous analysis of the engine failure and evaluation of their aircraft's airworthiness followed by the immediate, flawless execution of NATOPS procedures saved a valuable aircraft. It also kept the jettisoned ordnance and fuel tanks within the confines of the base, preventing damage and injury to civilian property and personnel.

Capt. Dave Miller, USMC (left),
1st Lt. Joe Scully, USMC (right).

Capt. Greg Mislick, USMC
Capt. Pat O'Donogue, USMC
Cpl. Rick Hogan, USMC
HMM 268

Immediately following transition to forward flight after lifting off from Spot Three of the USS *New Orleans* (LPH 11), with an internal load of a jeep and a trailer in their CH-46E, Capt. Mislick and Capt. O'Donogue experienced a severe vertical oscillation. Personnel on the flight deck reported seeing the aircraft fuselage twisting in flight, causing skin buckling. Since securing the Stability Augmentation System (SAS) and Automatic Trim System (ATS) was physically impossible due to the violence of the oscillation, Capt. Mislick applied combinations of full-left and full-right rudder pedal deflections with varied power settings, with no effect.

Throughout the emergency, the cockpit gauges were unreadable and both pilots were violently bouncing against the overhead circuit breaker panel, even with their harnesses locked.

The CH-46E entered a right turn and crossed the bow, proceeding down the starboard side of the ship at 30 to 50 knots while altitude dissipated from 150 feet to approximately 25 feet. Fighting the controls, Capt. Mislick was finally able to partially regain altitude as the aircraft continued its right turn across the stern. Finally, the oscillations dampened sufficiently to render the aircraft controllable. Because of his better vantage point for landing, the controls were passed to Capt. O'Donogue who conducted a SAS-off landing. Proper securing of the jeep and trailer by the crew chief, Cpl. Hogan, had eliminated the very real potential for catastrophe that would have resulted if the cargo had broken loose during the emergency. ◄

Capt. Greg Mislick (left),
Cpl. Rich Hogan (center),
Capt. Pat O'Donogue (right).

. . . Listen Bubba . . . no pilot ever got killed by a piece of paper work! . .

But I Thought I Was Going To Be a Pilot

By Capt. S.A. Bennet, USMC

REMEMBER all the hours you spent in flight school studying to earn those Wings of Gold? Next came many more hours studying in the RAG. Now you've arrived. You finally made it to the real world where you no longer have to worry about downs, screamers and studying ever again.

When you arrived at your first fleet squadron and saw your first squadron Special Order, you were probably just as shocked as I. I couldn't believe that I had 12 different jobs. Squadron pilot was at the **bottom** of the list — as an **additional duty**. My boss called me into his office to give me my welcome aboard brief. He said we would get along fine so long as I realized his priorities: "Job first, fly when it doesn't conflict with your job. After all, there is only one block on your fitness report that has anything to do with your flying abilities." So this was it — the mythical FMF. It wasn't quite what I expected.

I adjusted to the situation and threw myself into my work, trying to learn my "real" job. Most HACs I flew with were cool and didn't hassle me by asking aircraft limitations, systems and EPs, or quizzing me on preflights. I was becoming comfortable in the aircraft and familiar with the local area but wasn't really being challenged by the endless marlogs, cals, mals, fams and FCLPs. I began to forget everything I'd ever learned about the aircraft. About the only time I opened my NATOPS manual was to study for the monthly EP quiz during the break at pilot training. I rationalized this by telling myself, "The HAC will bail me out if anything happens," or "I'm just a co-pilot, I didn't sign for it." Besides, I had a lot of work to do, and I didn't have time to study NATOPS; it put me to sleep.

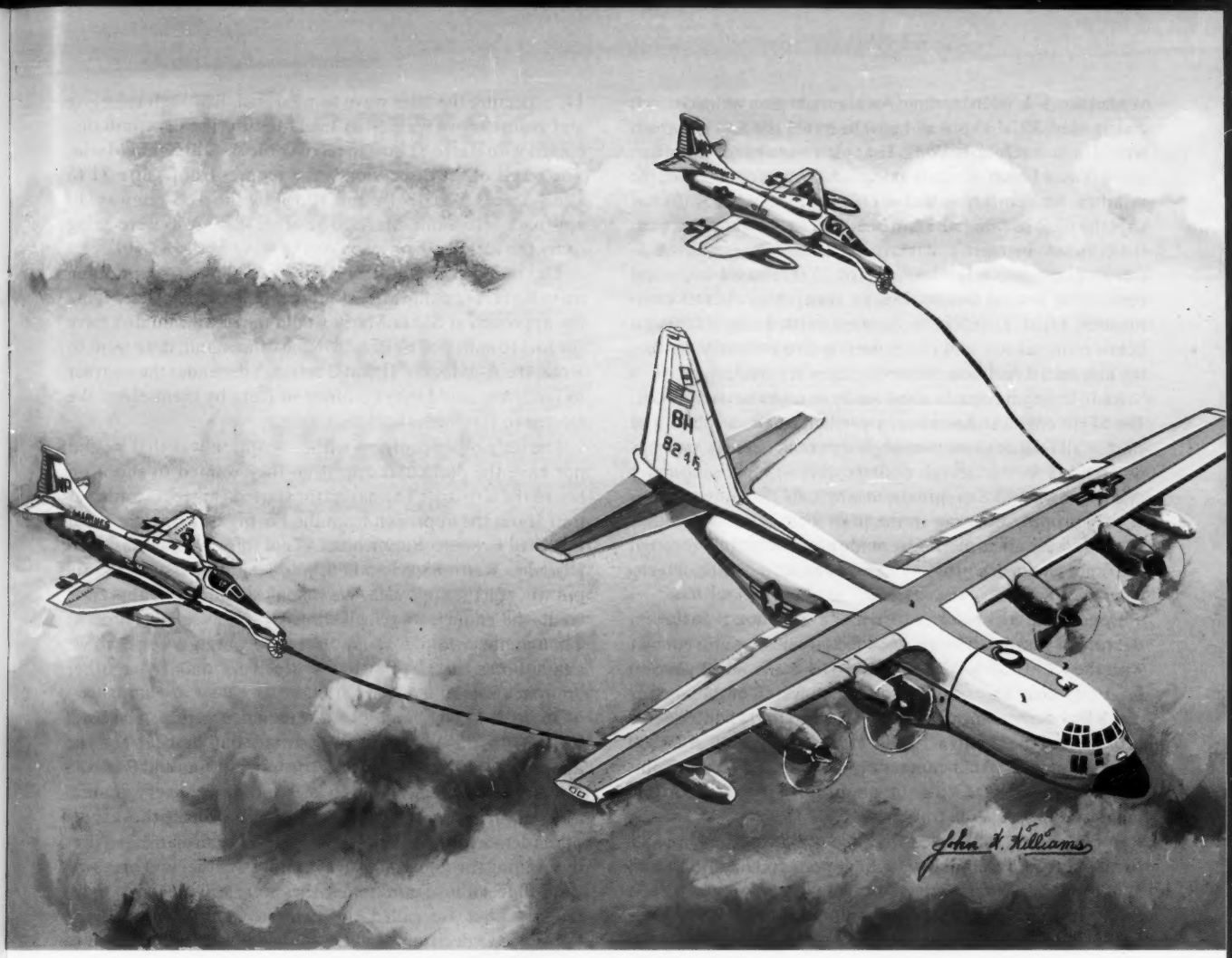
I thought I had every angle covered until my first tactics hop with the squadron weapons and tactics instructor. I approached this hop like all my others, walked into the ready room 15 minutes prior to brief time to do the load computation, ate a NATOPS breakfast (candy bar and soda) and shot the breeze. A few minutes into the brief, I knew I was in trouble when the major asked me to explain what the Assault Support Helicopter Tactical Manual said about the various terrain flight maneuvers, types of terrain flight and low-level navigation techniques. When I pleaded ignorance, he questioned me on systems, EPs and limitations, which I thought I managed to adequately bluff my way through. I was wrong! Ten minutes later, I was locked up in front of his desk doing the proverbial rug dance.

After flipping through my training jacket, he asked me why I hadn't prepared for this hop. I explained that I had been busy with work and didn't have time to prepare. He looked me straight in the eye and said, "Listen, Bubba, if you don't learn anything else from me before you leave here, remember this — no pilot ever got killed by a piece of paper work! It's good to know your desk job and do it well, but you're a pilot first. Your life and the lives of others depend on you. You have a responsibility to know your aircraft and its limitations, as well as your own. That involves constant study. You can't take off your pack and kick back now that you're in the fleet. The hard work is just beginning and you'll never stop learning your aircraft. It's easy to be just another pilot, but to be a professional pilot requires that extra effort, knowledge and desire."

I still remember those words today when I get bogged down by work and distracted by things other than flying. It makes me spend just a few extra minutes, before I hit the rack, to review EPs or get up a few minutes early to read the tactics manual before a mission. ◄

The bottom line is that a professional officer has to be the best at both jobs. It's obvious which job is less forgiving of error, even if it's only one block in your Fit Rep. Thoroughly prepare for all flights and leave your ground job on the ground. — Ed.

Capt. Bennet is CH-53 NATOPS officer for HMM 262(C) at MCAS Kaneohe Bay, Hawaii. He flies the CH-53D.



A Day to Remember

By Capt. J.D. Chase, USMC

In the winter issue of Approach, we ran a story about an A-4 squadron's ordeal crossing the Atlantic and meeting with unforecast weather. This article deals with the same story from the perspective of the KC-130 Aircraft Commander who came to their aid.

On March 5, 1986, my crew of seven, our KC-130, and I had been waiting at Lajes Field, the Azores, for eight days with an advance maintenance pack-up. We were waiting for A-4s from VMA 223 to arrive so we could continue our mission to Edinburgh, Scotland, thence to Bodo, Norway, to participate in exercise Anchor Express. The A-4s, originally scheduled to arrive at Lajes on Feb. 26, had been delayed by problems with the Air Force tankers and then by the weather.

The morning of the 5th, we received word from the Marine movement control officer that the A-4s with a KC-10 tanker were en route to Lajes from Pease AFB. Later that day, around 1540, my co-pilot received a call that six of the arriving A-4s needed immediate emergency tanking due to low fuel and poor weather conditions at Lajes. He immediately returned to our shared room, donned his flight gear, dispatched our navigator to gather the enlisted crew members, and went to find me at the gym. It was drizzling and the ceiling was right on the deck. It was hard enough to drive, let alone consider flying. The co-pilot and the enlisted crew went to the aircraft. My navigator and I went to base ops to get the brief.

On arrival we were informed by Marine and USAF reps that six A-4s (Retro 81-86) were due in one hour and that they would need fuel to continue on to Rota, Spain. The weather at Lajes was below minimums, intermittent 0/0, which pre-

vented the A-4s from landing. An alternate plan was to launch a strip alert KC-135 out of Lajes to refuel the KC-10, which would in turn refuel the A-4s. That plan was abandoned when the pilots of that aircraft declined to launch due to the weather. Remembering that sentence in OPNAV 3710 that says the pilot in command can bend or break weather mins in the event of emergency, I asked, "Is this an emergency situation?" The unanimous response of "Yes!" eased my mind concerning several factors: I was a very junior aircraft commander, I had no special instrument card, I was planning a below mins takeoff and not expecting to have to fly, neither my crew nor I had been observing crew rest requirements.

At 1618, my navigator and I made our way to the aircraft. The flight engineer had already preflighted the airplane and started all four engines. Although we could hear the engines, we couldn't see the aircraft until we were within a wingspan's distance away. We eventually made it to the runway, cautiously groping our way in the poor visibility. Six minutes later, we were airborne, a feat made possible mainly through the flight engineer's professionalism and high degree of technical skill.

Departing Lajes runway 16, with 58,000 pounds of fuel on board and passing through 3,000 feet, we made radio contact with the KC-10 (Gold 21) and Retro 81-86. Gold 21 gave an ETA overhead Lajes of 1640 at 41,000 feet. Continuing our climb and maintaining radio contact with Gold and Retro, we broke out of the clouds at 22,500 feet and leveled off at 23,500 feet. We gained visual contact on Gold 21 and Retro flight, and gave them vectors to us. At about 1700, they called a tally on us and maneuvered to refuel.

We were then confronted with two new problems. In order to maintain an acceptable refueling speed at that altitude and at our weight, we were forced to set military power and leave it there for a period of time that would well exceed NATOPS limits. We decided the operational necessity dictated doing it. The second problem we faced was our refueling hoses indicated they were "dead" when tested. This meant that there was no indication of hydraulic response to "soften" the hose and that a receiver could possibly set up a sine wave in the hose that could easily rip off his probe. We tried to minimize this possibility by cautioning the A-4s to be smooth and by providing a stable platform from which they could refuel. The problem with the hose turned out to be just a bad test; we did have response in the hose.

At 1707, the refueling began on the Lajes 120 radial at 90 DME with each A-4 taking an initial fuel load of about 2,000 pounds. All six receivers were then cycled through the tanker again to receive a total off-load of about 5,500 pounds each.

During the refueling, Gold 11, who had landed at Santa Maria earlier with the first wave of A-4s, advised Retro flight to attempt a landing there due to slightly better weather. Gold 11, expecting the later wave to need fuel, had been refueling and launched with a partial load, and during his climb discussed with Retro 81 how to recover the A-4s at Santa Maria. The result of the discussion was a request from Retro 81 to allow three A-4s to fly my wing on the ILS runway 19 approach into Santa Maria. The other three A-4s were going to fly the identical approach on the wing of the KC-10.

This request conflicted with our original plan of continuing on to Rota single ship after the refueling was complete. Flying the approach at Santa Maria would mean we wouldn't have the fuel to continue to Rota. On the other hand, if we went to Rota, the A-4s lacked ILS and couldn't get under the weather to land, nor could they continue to Rota by themselves. We elected to stay with the A-4s.

The only other problem with this option was that we did not have the particular approach they wanted to shoot on board the airplane. The navigator started gathering information about the approach from the Portugese controllers and the IFR Enroute Supplement. This information was then passed to Retro 83, 85 and 86, who had been assigned to fly our wing on the approach. We weren't sure that one approach would be enough to get all three wingmen safely on deck. Though our own fuel situation was becoming a concern, we again opted to stay with the receivers and fly another approach if required.

So, with 11,000 pounds of fuel, which is getting slim for a KC-130 in this situation, we started our descent for the approach. With Retro 83 and 86 on our left wing and Retro 85 on our right wing, we tried to keep our descent very gradual and our turns very shallow. During the approach, those three pilots demonstrated an outstanding level of airmanship. After descending through 20,000 feet of solid weather and breaking out 100 feet above minimums, they were still tucked in tight. On breakout we called the field in sight, continued the approach to decision height, and then initiated a wave-off to allow the A-4s to land. Turning to a missed approach heading of 280 and beginning our climb, we confirmed with Retro 83 that he and 86 had safely rolled out. The whereabouts of 85 was unknown. We thought he had remained with us, but we were quickly informed by Santa Maria tower that the runway was closed. Retro 85 had veered off the runway and sheared off a landing strut in the process.

Contacting Retro 83 again, we asked if there was anything further we could do to assist. The reply of "I don't know," coupled with a closed runway and a deteriorating fuel situation, dictated that we proceed to Lajes to attempt a landing. With all three A-4s accounted for, we continued climbing and contacted Lajes approach control. Proceeding to Lajes, we flew the ILS runway 16 approach to 100 feet above mins. We landed uneventfully at 1906 with 8,600 pounds of fuel remaining. ◄

Capt. Chase flies a KC-130 tanker with VMGR 253, a Marine aerial refueler transport squadron. At the time of the incident, he was assigned to VMGR 252.

Both the crew of the KC-130 (Otis 75) and the KC-10 (Gold 11) were recognized by Aviation Week and Space Technology magazine in their 1986 laurels tribute for outstanding airmanship. The KC-130 crew, Capt. Chase, Capt. Ramonowski, CWO2 Grigalis, M/Sgt Hunt, S/Sgt Ceybold, Cpl. Peeper and LCpl. Launkitis were all awarded Air Medals for their actions.

Helicopter Emergency Recovery System (HERS)

By Lt. Col. K.C. Corcoran, USMC

IT'S about time to take a giant leap forward in helicopter safety. We need to develop a system to bring a helicopter safely to earth should the crew be unable to fly the machine any longer because of mechanical malfunction or battle damage.

There has been much written about the importance of providing crash-worthy fuel systems and crew seats in future helicopter designs. These important initiatives should be incorporated as soon as possible. But these improvements have a relatively specialized role in terms of the entire flight envelope; they are of benefit only if the aircraft is relatively controllable and the terrain is suitable. In other words, to borrow from Mr. Hayden's theorems, they will save lives only within a relatively narrow band of energy potentials.

Helicopter sophistication and safety has been growing steadily over the years. The class A accident rate has improved significantly from 16.68 in 1965 to 2.95 in 1984. This noteworthy achievement can be attributed to such things as improved safety engineering and metallurgy, an expanded understanding of rotary wing aerodynamics and better flight control augmentation systems, in addition to the intensive safety education of aircrews.

We now have helicopters that are worth every bit as much as sophisticated tactical jet aircraft and that are the jet's technological equal. But there is one major difference besides the method of achieving lift: Damaged helicopters incapable of further flight cannot generally be abandoned by their crew while airborne. The crew of a jet in extremis can eject and have a shot at rescue. The crew, passenger or troops on a helicopter with loss of control or means of lift can only watch as the ground approaches.

Such loss is needless. As a former Naval Safety Center accident investigator, it is my opinion that an emergency recovery system would have saved most, if not all of the crews in six of the seven helicopter crashes which I investigated. These accidents ranged from flight control disconnects, to twin engine failure with accompanying loss of rotor RPM to mast bumping.

The HAC should have the equivalent of the jet pilot's ejection handle, which he can pull when he no longer has means to control his airborne aircraft. The system should work like the sequencing systems for jet ejection. Various charges could be placed to divest the fuselage of external dynamic components before rockets (again, as with jet ejection seats) would deploy and spreader guns would expand one or more large recovery parachutes, which would float the airframe to earth.

Granted, the airframe would not be flyable after a HERS letdown, but it should be recoverable and repairable; and best of all, the crew and passengers will be alive. The alternative to a HERS letdown when the airborne helicopter can no longer fly is a smoking hole — not much of a choice, is it?

We have the technology as a nation to provide such a system for all our helicopters, military and civilian, without too much of a penalty in terms of weight or complexity. After all, we pressure pack a jet crewman parachute into a box smaller than a volleyball. Besides, just how little are we prepared to do to save a life? The only way such innovation will happen is if a military standard is established. Who, for instance, would consider building a jet without an ejection seat? We need to apply the same mentality to future helicopter development. So what if such a system would take 10 years to develop — that's 10 years from whenever we start. Let's start now. Let's stop needlessly losing helicopters, crews and passengers. ◄

Lt. Col. Corcoran has flown a wide variety of fixed-wing and rotary-wing aircraft, including the A-4, A-6, F-4, AV-8, CH-53 and CH-46. He served a three-year tour as the Marine investigator in the Aircraft Mishap Investigation Division of the Naval Safety Center. He is currently the XO of MAG 12.

The Perfect "10"

By Lt.Col. T.P. Speer, USMCR

OVER the past 20 years, I've made some observations regarding the qualities that define the professional aviator. I've known and flown with many pilots over this stretch of time, and they all fall into that scale of zero to 10, most of them at the upper end. What makes a good pilot a truly professional aviator is something that is hard to put a finger on.

First and foremost, the professional aviators have had a thorough technical knowledge of their machines and the environment in which they fly. This starts with an intimate knowledge of aircraft systems, limitations and emergency procedures. The airman who learns and follows the NATOPS manual falls into the "professional" category. We've all known flyers who think that they have a better way. By and large, they are eventually proven wrong. Unfortunately, it often costs the taxpayers a bundle and it costs the pilots their lives.

Along with technical knowledge, every "10"-scale aviator makes use of all the tools given him to help use that knowledge, namely — checklists, weight and balance data, and performance charts. Just "swagging" it doesn't cut the mustard, as we have repeatedly proven to ourselves as we read about accidents in Approach, MIRs and the Weekly Summary.

Researchers have found that a majority of the accidents that occur in multi-piloted aircraft (and the same would likely apply to you single-seat jocks flying in section) are contributed to by misinformation or lack of information from sources both within and outside the cockpit.

The professional aviator uses every means at his disposal to continually update information that has the potential to sabotage his flight. Sometimes, this may be as simple as asking ATC for the latest PIREPS or correctly interpreting one's own radar set. The true "10" is always playing "What if?" and has the answer long before he gets backed into a corner and finds himself simultaneously running out of fuel, airspeed, altitude and ideas.

In my later years, I've recognized the management aspect of the professional aviator — self, crew or cockpit, and finally, squadron. All of us in leadership positions must not only master the technical aspects of our business but also operate within the confines of NATOPS, OPNAV and our individual SOPs. We have all seen leaders who mandate one thing and do the opposite. It's wrong, and loss statistics bear witness to that fact. In a multicrew aircraft, leadership by example becomes all the more important since what you do directly influences your junior squadron members. As a squadron commander, one is duty-bound to ensure the underpinning of a safe flying program is in place. To me, that means one thing —*standardization*. Implement an SOP, provide each of your pilots with adequate ground school and flight training and, last but not least, have your NATOPS evaluators ensure compliance through thorough and impartial check rides. All of this must start with the CO and filter down. All too often, we've allowed deviations from complete conformance with the principles of standardization; and once again, the results are frequently less than optimum.

The one quality that separates the good pilot (stick and rudder man) from the complete aviator is **attitude**. The true "pro" views every situation as an opportunity to learn something new. He never closes the door on a suggestion, even if it comes from the most junior officer or troop with whom he deals. He doesn't rely on past laurels (since one Delta Sierra can quickly wipe out a whole bunch of Attaboys), but on the ability to adapt and better perform his job tomorrow.

A "10"-scale aviator is a leader who not only knows the rules, but flies by them. ◄

Lt. Col. Speer is a 10,000-hour pilot in a variety of aircraft including the F-4, F-8, OV-10, UC-12 and the Boeing 727. He is former CO of the Marine Air Support Detachment at NAF Washington, D.C. He presently flies the 727 as a first officer for Eastern Airlines.

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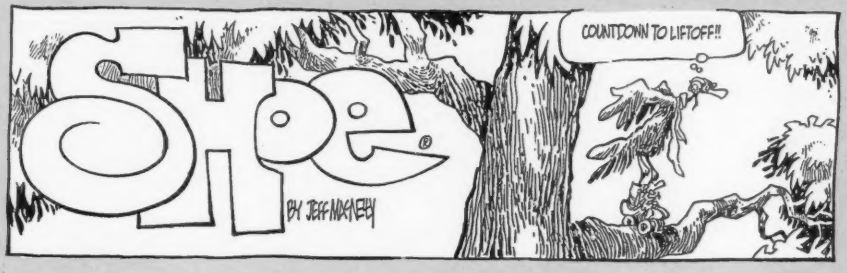
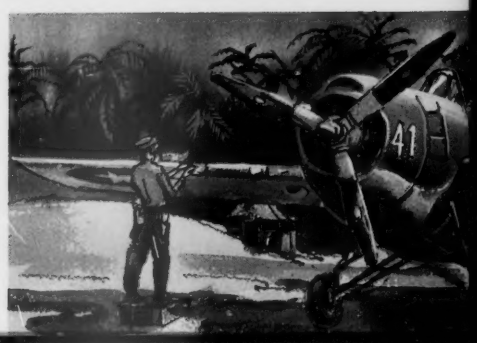


"Redouble your efforts to be combat-ready safely so that the effort of all our predecessors will not have been in vain, and so we can ensure the legacy for those who follow us."
Lt. Gen. Keith A. Smith DC/S (Air), May 1987.

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